

# Landsburg Mitigation Measures and Associated Research



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# Today's Presentation

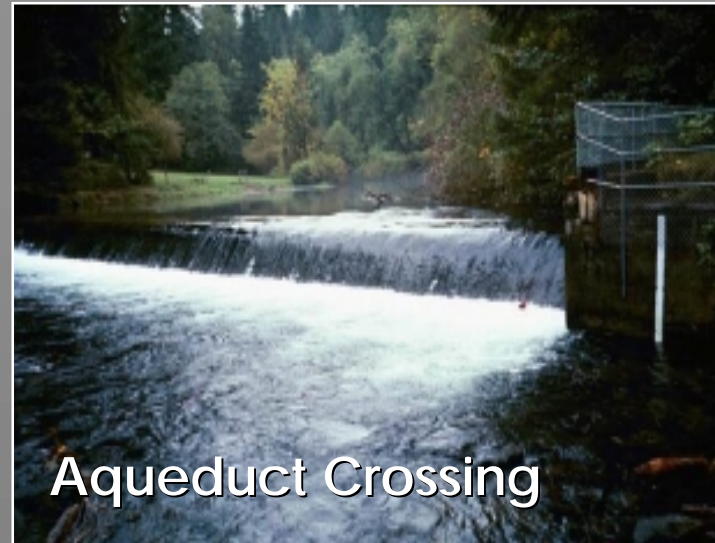
- Review Landsburg Mitigation components and briefly describe the associated:
  - purposes
  - actions
  - evaluation programs
  - resources

# Landsburg Mitigation Monitoring and Research

- Inform, evaluate, apply information
- Commitments and organizational structure provide:
  - Certainty - schedules and resources
  - Flexibility - framework for change in response to new information and ideas
  - Multi-agency and stakeholder involvement  
- Anadromous Fish Committee

# Landsburg Fish Passage

- Purpose: Restoration of anadromous access to 17 miles of habitat blocked for 100 years
- Action: Construction of upstream and downstream passage facilities by 2003



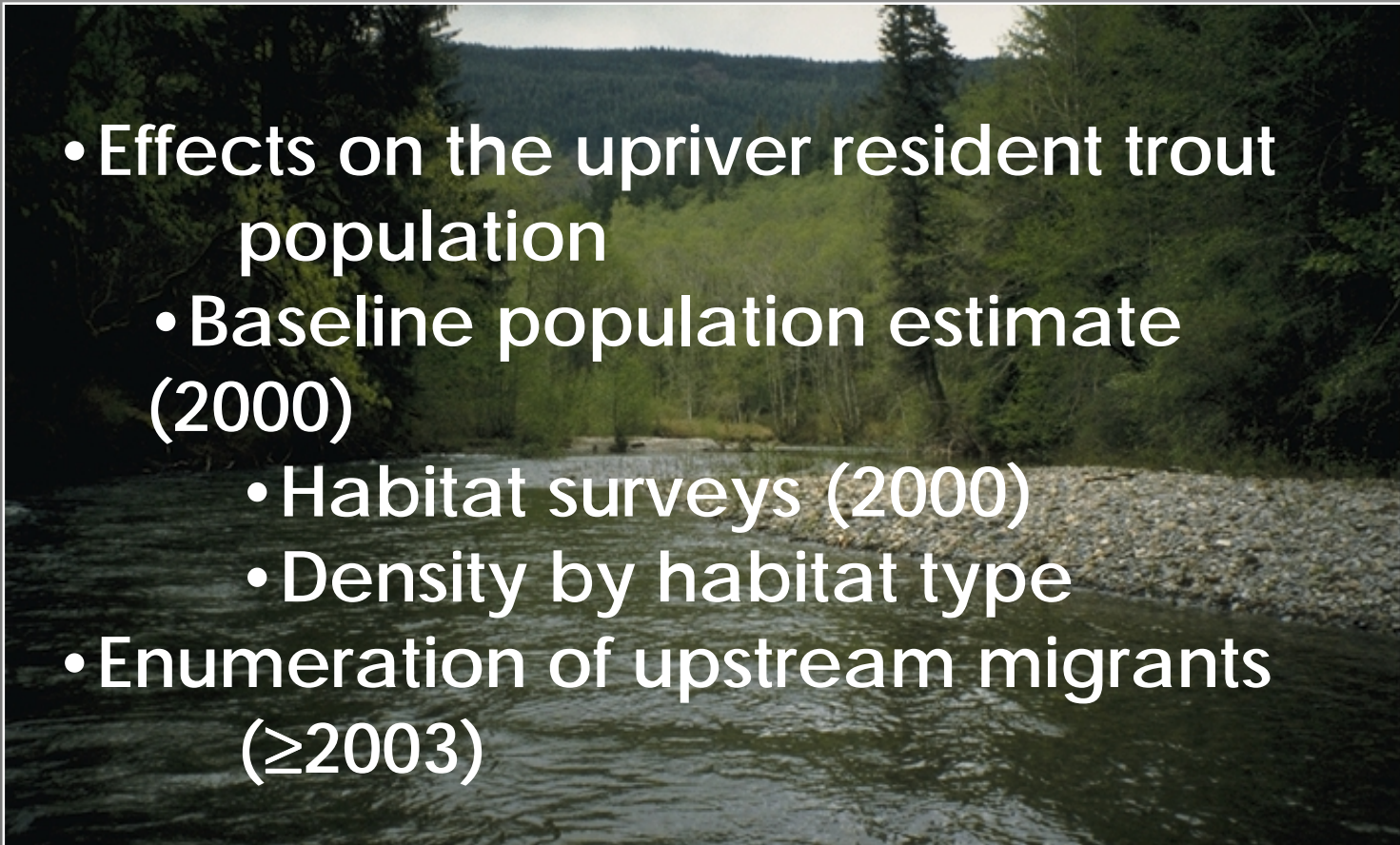
# Landsburg Fish Passage

- Evaluation: Effects of passage on upriver resident species and on nutrient levels
- NMFS and SPU studies began in 2000
- Resources: HCP: \$135,000 + NMFS funding



# Fish Passage Evaluation: Colonization by Anadromous Species

- Effects on the upriver resident trout population
  - Baseline population estimate (2000)
    - Habitat surveys (2000)
    - Density by habitat type
- Enumeration of upstream migrants ( $\geq 2003$ )



# Passage Evaluation: The Effects of Nutrients on Productivity

- Changes in ecosystem productivity resulting from marine-derived nutrients
  - 2 years baseline nutrient information + 5 additional years
  - Analyses of water and organic material
- 2000 results available
  - Contact Dr. Peter Kiffney, NMFS

# Interim Mitigation for Coho, Chinook and Steelhead

- Purpose: support actions to aid recovery of these species
- Action(s): Determined by NMFS, USFWS, WDFW and the City of Seattle
  - Research/Monitoring
  - Emergency supplementation
- Resources: HCP commits \$811,000 from 2001-2008



# Interim Mitigation for Coho, Chinook and Steelhead - Status: 2001

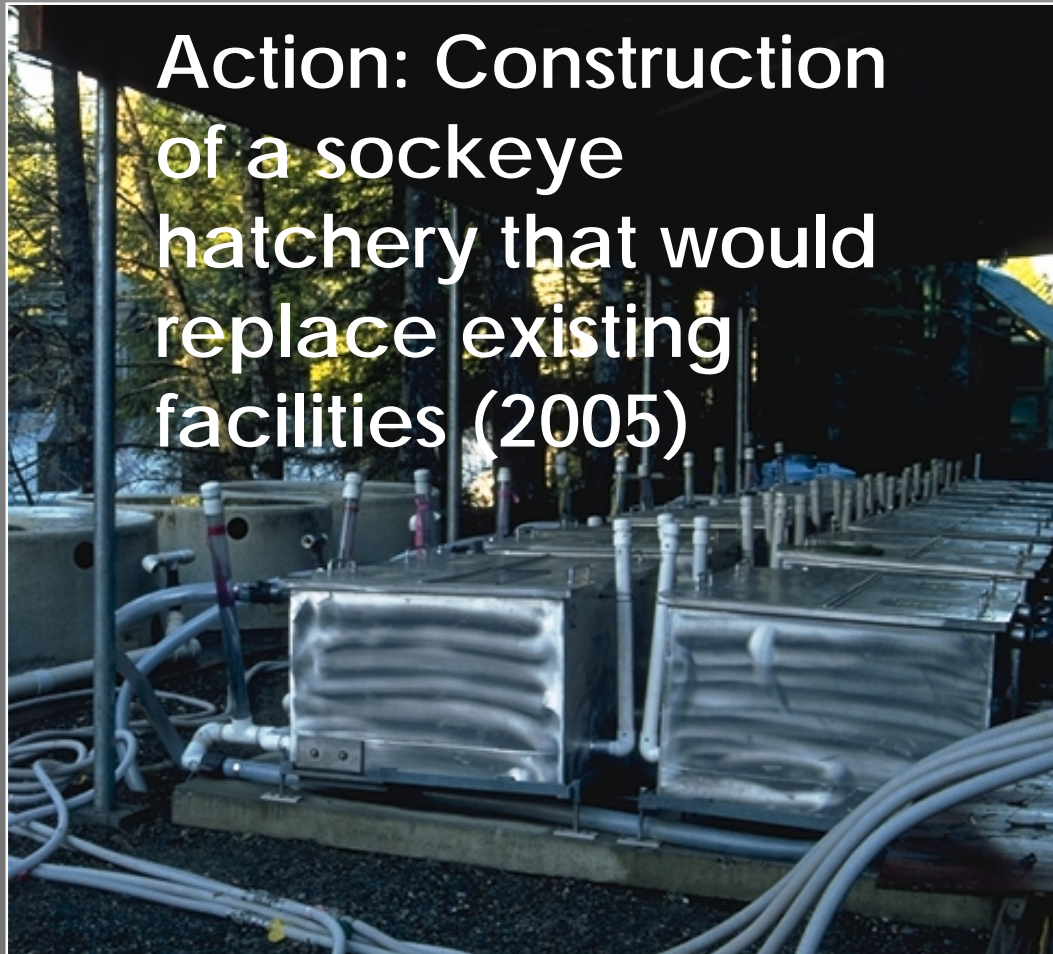
- WDFW received funding to collect information from chinook carcasses from the Cedar River
  - Sex
  - Length
  - Location
  - Scale and otolith sampling
- Contact: Steve Foley, WDFW

# Cedar River Sockeye Hatchery

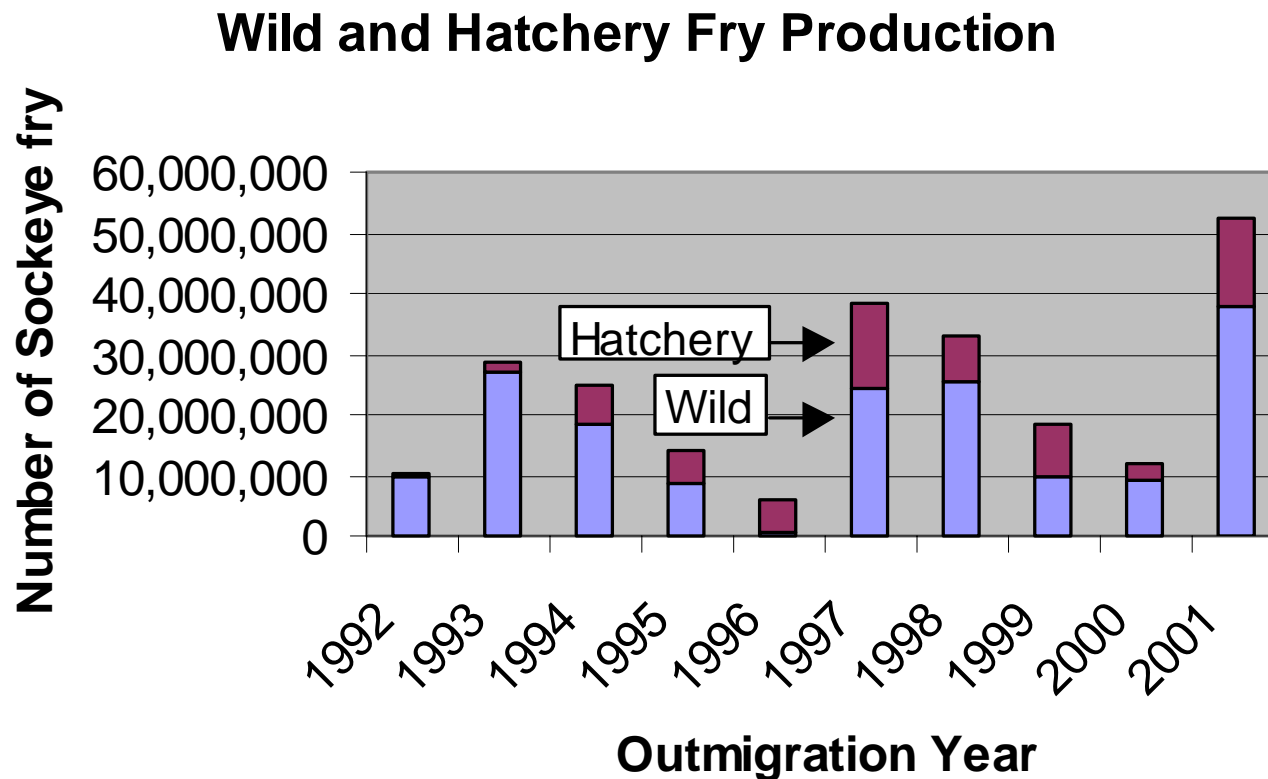
- Purpose: Meet mitigation responsibility and increase fishing opportunity, while:
  - Minimizing program effects on natural populations
  - Learning more about hatchery/wild interactions and ecosystem
  - Applying what is learned to improve program

# Cedar River Sockeye Hatchery

Action: Construction of a sockeye hatchery that would replace existing facilities (2005)



# Cedar River Sockeye Fry, 1992-2001 (Source: WDFW)



# Cedar River Sockeye Hatchery

- Evaluation:
  - Studies to evaluate the performance and effects of hatchery releases
  - Defined through adaptive management process
- Resources: \$3.9 million over 50 years

# Adaptive Management - Cedar R Sockeye Hatchery

Scientific and decision-making  
process

- Approach

- Identify uncertainties about the effects and performance of the project
- Develop hypotheses
- Gather relevant information, analyze and report



# Adaptive Management - Uncertainties

- Effects on other sockeye populations
- Effects on chinook
- Effects on Lake Washington ecosystem
- Effects on reproductive fitness of Cedar R sockeye
- Comparability between hatchery and natural origin sockeye

# Cedar River Sockeye Hatchery: Current Monitoring Program

- Fry marking (ongoing, WDFW)
- Fry trapping (ongoing, WDFW)
- Early diet of sockeye fry (2001, U. of Washington)
- Fall juvenile trawl survey in L. Washington (2001, U. of Washington)
- Adult survival and homing studies (ongoing, WDFW)
- Genetic evaluation of *O. nerka* populations (2000-2004, U. of W)

# What is being learned?

- Life history information on sockeye
- Mortality factors affecting juvenile salmonids
- Homing and straying within the Cedar River and the L. Washington Basin
- Growth and food supply
- Genetic relationships between sockeye populations

# What is being learned?

- Opportunity to study results of conservative hatchery practices
- Opportunity to evaluate the effects of release timing and location on adult returns
- Evaluate similarity between hatchery and naturally-spawned sockeye



## For further information

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